Table 3.4.3.1

PRINCEVILLE FLOOD RISK MANAGEMENT PROJECT

FLOOD RISK MANAGEMENT ALTERNATIVES

May 2008

Alternative Type	Alternative Symbol	Alternative Name	Description	Cost	Evaluation	Action
Without Project Alternative	**WP**	**Future Without Project**	Maintain existing conditions; no change to existing dike, structures, land or waters.	$0	No cost burden, but existing threat of flooding would remain; community of national importance may not be sustainable.	This alternative does not promote a sustainable community in accordance with the Presidential Executive Order, nor does it comply with any one of the 12 Actions for Change.
Nonstructural Alternatives	**NS-1**	**Floodproof Structures**	Flood proof all residential and commercial structures to a level which would prevent damage from the 1% flood event.	approx. $75-100 million	Due to depth of potential flooding, food proofing would be either impractical or infeasible for many of the buildings, and high cost would make it economically infeasible.	Screened out.
	NS-2	**Elevate Structures**	Raise all existing residential and commercial structures to elevations above level of the 1% flood event.	$24 million minimum	Raising all structures above the 1% flood level would be economically infeasible and impractical due to the required raising heights. Access would also be impractical for many residents, who are of advanced age.	Screened out.
	NS-3	**Relocate Entire Town**	Relocate all residential and commercial structures to high ground outside the Tar River floodplain.	$200-400 million	Wholesale relocation would be economically infeasible, and likely would be unacceptable to residents.	Screened out.
	NS-4	**Buy Out Residents**	Buyout of residents' property, requiring them to move to structures ouside the floodplain.	$50-70 million	FEMA offered a buyout to residents in October 1999, which was rejected by the town council.	Screened out.
	NS-5	**Flood Evacuation and Education Plans**	Implement Flood Warning and Evacuation Plan and Flood Risk Management Education and Communication Plan.	$60,000	These plans would provide reliable warning and evacuation procedures for residents of Princeville. They would also educate residents on their flood risks, and costs of mitigation of the residual risks.	Considered alternative.
Structural Alternatives	**S-1**	**Build Ring Dike**	Construct a dike around the entire town to prevent floodwaters from entering.	$200 million	Difficult ingress and egress for residents. Severe interior drainage problems. Economically infeasible. Rejected by the town council.	Screened out.
	S-2	**Construct Reservoirs**	Construct reservoirs along the Tar River upstream of Princeville to retain floodwaters and prevent flooding in town.	$100-300 million	Impractical to locate sites for the required reservoirs. Not likely to eliminate or even reduce Princeville flooding. Economically infeasible.	Screened out.
	S-3	**Modify River Channel**	Deepen and/or widen the existing Tar River channel to decrease floodwater levels.	not estimated	Infeasible due to critical environmental impacts, particularly the presence of the endangered Tar River Spinymussel. USFWS "jeopardy" opinion would halt the project.	Screened out.
	S-4	**Modify Bridges**	Modify the existing bridges at US 64 and Main street to reduce floodwater elevations upstream.	$10-15 million	Projected water surface elevation reduction due to bridge modifications is minor and would provide only minimal benefit.	Screened out.
	S-5	**Construct Bypass Channel**	Construct a high-flow channel to convey floodwaters around Princeville and reduce flooding within the town.	$150-400 for land purchase and mitigation alone	Economically infeasible. Objection by the town.	Screened out.
	S-6	**Raise and Extend Existing Dike**	Raise and extend the existing dike to decrease the level of flood risk.	$40-50 million	Raising top of the existing dike would increase flood levels in Tarboro, and upstream of the dike, violating a constraint of the project.	Screened out.
	S-7	**Extend Existing Dike**	Extend the existing dike to block flanking floodwaters and decrease the level of flood risk to design level of existing dike.	$12-25 million	Extension of the existing dike could prevent floodwaters from flanking the dike prior to overtopping, as happened during Hurricane Floyd. Improvement of FRM from 1.7% to 0.333%. Economically feasible.	Considered alternative.
	S-8	**Improve Interior Drainage**	Install features that would allow reliable removal of stormwater runoff from low areas inside the dike.	$5-10 million	Interior drainage features would take the form of pumps with a collection system. They would reduce flood damage to buildings from interior rainfall runoff accumulation.	Considered alternative.
	S-9	**Flood Measures for Water and Sewer Plants**	Construct flood risk management measures at Tarboro water and wastewater treament plants.	?	Measures would decrease flood risk for the plants, to equal that of the existing dike. Would provide operational water and wastewater service up to the time of dike overtopping.	Considered alternative.

Table 3.4.3.2

PRINCEVILLE FLOOD RISK MANAGEMENT PROJECT

POTENTIAL MEASURES FOR ALTERNATIVE S-7, EXTEND EXISTING DIKE

May 2008

Location	Measure Symbol	Measure Name	Description	Cost	Evaluation	Action
Downstream, South Side of Princeville from US Hwy 64	**A**	Berm and floodwall, US 64	Construct a new berm and floodwall along the northeast side of US Highway 64, at the low portion.	$5,620,000	This measure would be used in conjunction with an upstream measure(s). Would increase flood risk management benefit on the south side of Princeville to 0.333%, to match that of the existing dike. Will allow flooding in 0.3% floods or worse, when existing dike would be overtopped.	Considered measure.
Upstream, North Side of Princeville from US Hwy 258	**B**	Raise US 258 and Shiloh Farm Road; ramp drives.	Raise US 258 from existing dike to Shiloh Farm Road, and Shiloh Farm Road, to elevation 50. Ramp 30 existing driveways up to raised roadway.	$13,900,000	Relatively simple alignment. Numerous ramps required for drive access. Most construction is on NCDOT right-of-way, minimizing O&M costs. Moderately extensive area of flood risk management benefit.	Considered measure.
	C	Raise US 258 and Shiloh Farm Road; service road along highway.	Raise portions of US Highway 258 and Shiloh Farm Road to their intersection. Create service road along highway for access to existing driveways.	$13,940,000	According to NCDOT, there is inadequate horizontal clearance between houses and existing highway to meet safety requirements for a service road.	Screened out.
	D	Raise US 258 and Shiloh Farm Road; service road behind houses.	Raise portions of US Highway 258 and Shiloh Farm Road to their intersection. Create service road behind rows of houses for drive access.	$13,890,000	Potential resident objection to principle access from rear of houses: access to carports, entrances.	Considered measure.
	E	Raise US 258 and Shiloh Farm Road; berm/ floodwalls cross US 258 near **creek**.	Raise a portion of US Highway 258. Build earth berm and floodwall along woods line which crosses US 258 **near creek** at NC Highway 1517 intersection. Continue berm and floodwall along woods line to Shiloh Farm Road and **raise** Shiloh Farm Road to elevation 50 from this point to natural ground.	$17,460,000	Maximum area of flood risk management benefit. No change to intersection; only 2 driveways to ramp. Complex configuration of berms/floodwalls.	Considered measure.
	F	Raise US 258; Shiloh Farm Road **floodwall**; berm/floodwalls cross US 258 near **creek**.	Raise a portion of US Highway 258. Build earth berm and floodwall along woods line which crosses US 258 **near creek** at NC Highway 1517 intersection. Continue berm and floodwall along woods line to Shiloh Farm Road and **build floodwall** along Shiloh Farm Road.	$19,430,000	Maximum area of flood risk management benefit. No change to intersection; no driveways to ramp. Complex configuration of berms/floodwalls.	Considered measure.
	G	Raise US 258; Shiloh Farm Road floodwall; berm/floodwalls cross US 258 near **river bend**.	Raise a portion of US Highway 258. Build earth berm and floodwall along woods line which crosses US 258 **near river bend**. Continue berm and floodwall along woods line to Shiloh Farm Road and build floodwall along Shiloh Farm Road.	$19,380,000	Near-maximum area of flood risk management benefit. No change to intersection; no driveways to ramp. Complex configuration of berms/floodwalls.	Considered measure.
	H	Raise NC 111; berm/floodwall along woods line to dike.	Raise NC Highway 111. Build earth berm and floodwall along woods line to existing dike.	$15,920,000	Shortest alignment. Driveway access modifications needed. No extended area of flood risk management benefit. Houses outside dike extension would need to be raised for flood risk management benefit. Landowner objection to alignment.	Considered measure.
	I	Raise NC 111; berm along woods line to dike.	Raise NC Highway 111. Build earth berm along woods line to end of existing dike.	$12,560,000	Shortest alignment. Driveway access modifications needed. No extended area of flood risk management benefit. Houses outside dike extension would need to be raised for flood risk management benefit. Landowner objection to alignment.	Considered measure.
	J	Raise US 258 and Shiloh Farms Road; floodwall from Cummings Lane to Shiloh Farm Road.	Raise portions of US Highway 258 and Shiloh Farms Road. Build floodwall along line of Cummings Lane and extend to Shiloh Farm Road.	$18,000,000	Moderate alignment length. Minor driveway access modifications needed. Little extended area of flood risk management benefit. Houses outside dike extensions would need to be raised for flood risk management benefit.	Considered measure.
	K	Raise Shiloh Farm Road near NC 111	Raise portions of Shiloh Farm Road up to elevation 49: intersection with NC Highway 111 and 4600 feet north. Also a 2850-foot segment of Shiloh Farm Road beginning 5000 feet south of NC 111.	?	This measure would be used in conjunction with either Measure B, D, E, F, G, or J to block flanking floodwaters in this area, ensuring flood risk management benefit to 0.333%, matching that of the existing dike.	Considered measure.